REMARKS

Claims 1-16 are pending in the Office Action. Claims 1-2, 5, 8, 10, 14, and 16 are rejected. Claims 3-4, 6-7, 9, 11-13, and 15 are objected to. Claim 5 was objected to in the Office Action Summary but was rejected in the Detailed Action. Applicant has assumed that Claim 5 is rejected. Claims 1 and 16 have been amended. The Specification and Claims have been amended to improve grammar or correct typographical errors only. No new matter has been added. The rejections of the claims are respectfully traversed in light of the amendments and following remarks, and reconsideration is requested.

Rejections Under 35 U.S.C. § 102

Claims 1, 8, 14, and 16 are rejected under 35 U.S.C. § 102(b) as being anticipated by Distefano et al. (U.S. Patent No. 5,794,330 hereinafter "Distefano"). In rejecting the claims, the Examiner writes in part:

> Distefano discloses, referring to figures 1-4, an electric contact probe assembly, comprising: a non-electroconductive support sheet (32) having a front and reverse sides and at least one through hole (42); an electroconductive patch (38, 40) attached to a part of the support sheet adjacent to the through hole; an electroconductive resilient probe member (57) having a base end attached to the patch and a free end projecting from the front side of the support sheet; and a circuit board placed over the reverse side of the support sheet and having a circuit layer incorporated therein and a terminal facing the reverse side of the support sheet; the support sheet being fixedly attached to the circuit board by an electroconductive bonding member which both physically and electrically connects the patch with the terminal (not shown, but described in col. 12, lines 15-20) [claims 1, 16], wherein the patch is attached to the front side of the support sheet so as to expose at least a part of the patch to the interior of the through hole [claim 8], wherein the electroconductive bonding member comprises a solder lump (see col. 12, lines 15-20) [claim 14]. (emphasis added).

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However, Applicant believes Distefano does not disclose a resilient probe member with a free end projecting from the front side of the support sheet when the support sheet is attached to a circuit board. Instead, Distefano discloses the following:

> As illustrated in FIGS. 6 and 7, the finished connection component 90 is placed onto a semi-conductor chip 92 so that the bottom surface 81 of support layer 80, and adhesive layer 88 confront the top surface 94 of the chip, and so that top sheet 32 is remote from the chip. The connection component is juxtaposed with the chip so that the bottom end or tip 58 of each lead 57 is aligned with a contact 95 of the chip.
>
> . . .
>
> As the liquid phase is depleted of tin, it solidifies and forms a solid weld between the lead 57 and chip contact 95. . . .
>
> As a result of this treatment, the chip and connection component form a subassembly substantially as illustrated in FIG. 7 with the connection component 90 on top of chip 92.
> (Distefano, col.10, line 66-col.11, line 64).

Thus, Distefano discloses a subassembly of a chip (or microelectronic unit) and a connection component in which both ends of lead 57 are fixed. (Distefano, FIG. 6).

In contrast, independent Claim 1 recites "an electroconductive resilient probe member having a base end attached to the patch and a free end projecting from the front side of the support sheet; and . . . the support sheet being fixedly attached to the circuit board by an electroconductive bonding member which both physically and electrically connects the patch with the terminal."

Similarly, independent Claim 16 recites "attaching a base end of an electroconductive resilient probe member to the patch so as to cause a free end thereof to project from the front side of the support sheet; . . . and melting and resolidifying the soldering or brazing material so as to connect the patch and the circuit board terminal together both electrically and physically."

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Therefore, because Distefano does not disclose or suggest all the limitations of Claims 1 and 16, Claims 1 and 16 are patentable over Distefano.

Claims 8 and 14 are dependent on Claim 1 and contain additional limitations that further distinguish them from Distefano. Therefore, Claims 8 and 14 are allowable over Distefano for at least the same reasons provided above with respect to Claim 1.

Claims 1, 2, 5, 10, and 16 are rejected under 35 U.S.C. § 102(b) as being anticipated by Baumberger et al. (U.S. Patent No. 5,297,967 hereinafter "Baumberger"). In rejecting the claims, the Examiner writes in part:

> Baumberger discloses, referring to figure 10, an electric contact probe assembly, comprising: a non-electroconductive support sheet (51) having a front and reverse sides and at least one through hole; an electroconductive patch (55) attached to a part of the support sheet adjacent to the through hole; an electroconductive resilient probe member (61) having a base end attached to the patch and a free end projecting from the front side of the support sheet; and a circuit board (19) placed over the reverse side of the support sheet and having a circuit layer incorporated therein and a terminal (25) facing the reverse side of the support sheet; the support sheet being fixedly attached to the circuit board by an electroconductive bonding member (99) which both physically and electrically connects the patch with the terminal [claims 1, 16], wherein the electroconductive resilient probe member comprises a compression coil spring [claim 2], further comprising a housing layer (53) placed over the front side of the support sheet, the housing layer defining a holder hole through which a free end of the compression coil spring projects [claim 5].
>
> Alternately, Baumberger discloses, referring to figure 10, an electric contact probe assembly, comprising: a non-electroconductive support sheet (53) having a front and reverse sides and at least one through hole . . . , wherein the patch is attached to the reverse side of the support sheet so as to expose at least a part of the patch to the interior of the through hole [claim 10].

However, Applicant believes Baumberger does not disclose an electroconductive patch attached to a part of the support sheet adjacent to the through hole. Instead, Baumberger discloses the following:

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> In FIG. 1, a singular sheet 71 of flat conductive material is provided . . . which . . . will eventually form the conductive element of the invention.
>
> A grouping of predetermined-shaped curvilinear elements 73 and rectangular "pads" 77 (each associated with one element) are formed in FIG. 1, preferably using an etching procedure or the like. . . . Each of these formed, curved elements is understood to eventually comprise the expanded helical portions of the respective conductive elements 55 of the invention as shown in FIG. 6.
>
> FIG. 2 shows the curved elements 73 and pads 77 formed. . . .
>
> As shown in FIG. 3, sheet 71 . . . is . . . substantially covered on opposite surfaces thereof with a layer of dielectric material 51 and 53 . . . . [A] window 91 is provided within each layer relative to one of the elements 73. This window, preferably rectangular, is slightly less than the corresponding width of the rectangular pad sections 77. (Baumberger, col.5, line 42 – col.6, line 26).
>
> . . .
>
> In FIG. 5, each of the substantially rectangular shaped segments 77 is electrically isolated from adjacent segments and also from the boundary (peripheral) portions 79 of the interim sheet 71. . . . [T]his punching or similar removal operation causes a separation of the connecting tabs 81 to thereby isolate the previously formed pad sections so as to form the now finally identified conductive elements 55 of the configuration depicted in the cross-sectional view in FIG. 6 prior to helical extension.
>
> In the next step of the invention, the helical portions of the invention are extended outwardly a predetermined distance. (Baumberger, col.7, lines 21-38).

Thus, Baumberger discloses a window 91 is provided within each dielectric layer to expose curvilinear elements 73 and pad sections 77 that are of the same conductive material, and which corresponds to conductive element 55 of FIG. 10. Baumberger does not disclose a separate conductive member, such as a patch, attached to a dielectric layer adjacent a through hole.

Furthermore, Baumberger discloses that conductive helical portions from the same conductive sheet 71 are extended outward from the sheet plane. Baumberger does not disclose a separate conductive member, such as a probe member, attached to a separate conductive member.

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In contrast, independent Claim 1 recites "an electroconductive patch attached to a part of the support sheet adjacent to the through hole" and "an electroconductive resilient probe member having a base end attached to the patch."

Similarly, independent Claim 16 recites "attaching an electroconductive patch to a part of the support sheet adjacent to the through hole" and "attaching a base end of an electroconductive resilient probe member to the patch."

Therefore, because Baumberger does not disclose or suggest all the limitations of Claims 1 and 16, Claims 1 and 16 are patentable over Baumberger.

Claims 2, 5, and 10 are dependent on Claim 1 and contain additional limitations that further distinguish them from Baumberger. Therefore, Claims 2, 5, and 10 are allowable over Baumberger for at least the same reasons provided above with respect to Claim 1.

In view of the foregoing, Applicant respectfully requests that the rejections under 35 U.S.C. § 102(b) be withdrawn.

Allowable Subject Matter

Claims 3-4, 6-7, 9, 11-13, and 15 are objected to as being dependent upon a rejected base claim. Applicant gratefully acknowledges the Examiner's indication that the aforementioned claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Based upon the amendments and remarks above, Applicant believes Claims 3-4, 6-7, 9, 11-13, and 15, which are dependent upon Claim 1, are allowable for at least the same reasons provided above with respect to Claim 1.

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CONCLUSION

For the above reasons, Applicant believes pending Claims 1-16 are now in condition for allowance and allowance of the Application is hereby solicited. If the Examiner has any questions or concerns, the Examiner is hereby requested to telephone Applicant's Attorney at (949) 752-7040.

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231, on May 19, 2003.

Sandy Kim

May 19, 2003

Respectfully submitted,

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ATTACHMENT A

16. (Amended) A method for making an electric contact probe assembly, comprising the steps of:

preparing a non-electroconductive support sheet having a front and reverse sides and at least one through hole;

attaching an electroconductive patch to a part of the support sheet adjacent to the through hole;

attaching a base end of an electroconductive resilient probe member to the patch so as to cause a free end thereof to project from the front side of the support sheet;

preparing a circuit board having a circuit layer incorporated therein and a terminal exposed on one side thereof;

depositing an amount of soldering or brazing material on at least one of the patch and the circuit board terminal;

placing the circuit board over the reverse side of the support sheet with the terminal directly opposing the patch; and

melting and resolidifying the soldering or brazing material so as to connect the patch and the circuit board terminal together both electrically and physically.

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ATTACHMENT B

Please replace the paragraph on page 3, starting on line 8, with the following replacement paragraph.

A third object of the present invention is to provide an electric contact probe assembly which [is demonstrate] demonstrates low electric resistance.

Please replace the paragraph on page 3, starting on line 12, with the following replacement paragraph.

According to the present invention such objects can be accomplished by providing [An] an electric contact probe assembly, comprising: a non-electroconductive support sheet having a front and reverse sides and at least one through hole; an electroconductive patch attached to a part of the support sheet adjacent to the through hole; an electroconductive resilient probe member having a base end attached to the patch and a free end projecting from the front side of the support sheet; and a circuit board placed over the reverse side of the support sheet and having a circuit layer incorporated therein and a terminal facing the reverse side of the support sheet; the support sheet being fixedly attached to the circuit board by an electroconductive bonding member which both physically and electrically connects the patch with the terminal.

Please replace the paragraph starting on page 10, line 21, with the following replacement paragraph.

A burn-in test can be conducted in this manner. Electric current flows axially through the coil-shaped resilient probe member 2 as far as the closely wound electrode section 2b and the closely wound conical section or the electrode section 2c are concerned, and circumferentially through the coil-shaped resilient probe member 2 only in the coarsely

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wound section 2a (which consists of a single turn in the case of the illustrated embodiment). Therefore, the electric flow path is extremely short, and this contributes to the reduction in the resistance and inductance against the transmission of high frequency signals. The connection to the relay circuit board 6 is achieved by soldering, instead of a simple contact by an electrode (as is the case with an electric contact probe assembly having two moveable ends), so that the problem of a contact resistance does not exist. By minimizing the thickness of the support sheet 3, the thickness of the electric contact probe assembly 1 (the axial length of the coil-shaped resilient probe member 2) can be minimized, and so is the overall thickness of the electric contact probe [assembly] assembly.

Please replace the paragraph starting on page 10, line 11, with the following replacement paragraph.

When the electrode section 2b of the coil-shaped resilient probe member 2 is desired to be brought into contact with the object to be contacted in the axial direction, the electrode section 2b should have a perpendicularity as precisely as possible. Therefore, the coil end of the closely wound section 2c of the coil-shaped resilient probe member 2 may be ground so as to form a ground surface 2d which is perpendicular to the axial line of the coil-shaped resilient probe member 2 (the center line in the drawing) as shown in Figure 5. This facilitates the placement of the coil-shaped resilient probe member 2 on the support sheet 3. In the case of the embodiment shown in Figure 5, [the] both ends of the coil are ground. Therefore, the coil end of the electrode section 2b is also formed with a ground surface 2e which is perpendicular to the coil axial line. As a result, the electrode section 2b can be brought into contact with the planar pad 9a such as the one as illustrated in Figure 4 in a stable fashion. In particular, because the contact surface with respect to the pad 9a is relatively large, a localized

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high contact pressure can be avoided, and the pad 9a would not be damaged even when it is made of a relatively soft material.

Please replace the paragraph on page 16, starting on line 2, with the following replacement paragraph.

The closely wound section 2c can be integrally attached to the support sheet 3 with the coil end of the closely wound section 2c fitted into the inner bore jointly defined by the raised pieces, and located so as to reach the reverse surface of the base portion of the patch [4] 13. By doing so, the projection of the coil-shaped resilient probe member 2 can be reduced even further (by the combined thickness of the support sheet 3 and the patch 13), and so is the thickness of the entire assembly.

Please replace the paragraph on page 16, starting on line 16, with the following replacement paragraph.

The object to be contacted is not limited to those having a planar surface as was the case with the [land] pad 9a which was illustrated earlier, but may have a bulging surface as shown on the solder ball 14 in Figure 20. This coil-shaped resilient probe member 15 comprises an intermediate coarsely wound section 15a, a closely wound section [15b] 15c on a coil end which is soldered to the patch 4, and an electrode section [15c] 15b which consists of a coarsely wound section connected to the afore-mentioned coarsely wound section 15a.

Please replace the paragraph on page 17, starting on line 5, with the following replacement paragraph.

In this straight coil-shaped resilient probe member 15 also, as was the case with the embodiments illustrated in Figure 7, [the] both ends may be ground, only one of the ends may

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be ground or a reduced diameter section (planar end) may be provided on the base end, and these embodiments produce similar results as the corresponding embodiments shown in Figures 5 to 7.

Please replace the paragraph on page 18, starting on line 8, with the following replacement paragraph.

Thus, the present invention provides [a] favorable handling even when a large number of resilient probe members are provided on a single [sheet] support sheet. Because through holes can be easily formed in such a [sheet] support sheet, by fixedly attaching an electroconductive member to the support sheet with a part of the electroconductive member exposed to the through hole, the support sheet can be bonded to the terminal of the circuit board by virtue of the solder or brazing material which is filled into the through hole. Because there is no intervening contact member in the path of electric conduction, the high frequency performance can be improved, and a satisfactory testing of semiconductor devices for high frequency signals is made possible.

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